COOPERATIVE AGREEMENT ON HUMAN SETTLEMENTS AND NATURAL RESOURCE SYSTEMS ANALYSIS

THE ROLES OF INFRASTRUCTURE AND SECONDARY CITIES IN UNBALANCED REGIONAL DEVELOPMENT STRATEGIES

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I. Introduction

In developing countries, policies based on Western-inspired models for regional development planning have too often failed to bring significant benefits to the rural poor. Recent widespread reactions against these approaches, which tend to rely on top-down spatial-temporal development processes and strategies, clearly are justified in many respects. However, well-meaning alternative proposals emphasizing, for example, rural-based participatory planning, basic needs, and regional closure in lagging areas run the risk of substituting short term, tactical, relief-and-welfare measures for long term strategies that address the root causes of rural poverty. Instead, what may be needed is long-term strategies addressing productivity and the enhancement of real income.

The present paper outlines some of the key elements that should be considered in formulating and implementing long-term rural development strategies focused on productivity, which in the final analysis always determine the level of real incomes. At the outset, it should be noted that successful long-term rural development requires sustained political commitment, especially in view of the fact that essential transformations may not become evident in only a few years. Moreover, as critics of top-down development models have pointed out, in many countries it also would be desirable to have a greater political commitment to an equitable pattern of income distribution, which may, in turn, require a more equitable distribution of political power. Nevertheless, these are internal matters of concern to a country's policy makers. As Johnson and Clark (1982) remind us, to bewail "the unequal distribution of power is about as conducive to resolving 'essentially political' problems as bewailing the unequal distribution of rainfall is to resolving 'essentially agricultural' ones. Good policy analysis, as opposed to good intentions, consists in learning to understand the constraints of power -- be it man's or nature's -- and in learning to shape feasible programs within the limits they impose" (p. 13).

A. Balanced Versus Unbalanced Growth

Sustained increases in economic well-being require that the quantity and productivity of directly productive activities be enhanced over the long term. However, before this can happen it is necessary to have a supporting network of public infrastructure, often referred to as public overhead capital. This infrastructure consists of roads, bridges, power plants, health facilities, and schools. Following the Second World War, a number of economists maintained that economic development could be accelerated by the simultaneous balanced growth of a large number of interdependent projects. The principal rationale for this position argued that investments in both directly productive activities and infrastructure that would not be profitable in isolation would become productive taken together because of mutually beneficial external economies. The applicability of such a strategy to developing countries was properly questioned on the grounds that the resources required for implementing it would be so great that a country disposing of them would not be appropriately classed as underdeveloped.

It may be noted that the balanced growth approach is similar in many respects to "intergrated regional development," a concept recently applied in the developing country context. In principle, it would be difficult to deny that development could be promoted through the articulation of urban systems, as well as by initiation and integration of a number of desirable production and service functions. But again, the resources to do many things simultaneously are nearly always lacking. Moreover, the relevant literature had devoted relatively little attention to theories, guidelines, or criteria for the allocation of priorities. Similarly, little attention is given to the temporal sequencing of investment choices. Attempts at practical implementation have resulted in greater recognition of the need to deal with these issues (Rondinelli and Evans 1983).

In contrast to the proponents of balanced growth, Hirschman (1958), Myrdal (1957), and Perroux (1964) point out that de facto economic development does not appear simultaneously and uniformly throughout an economy. Hirschman further argues that development strategies ought to concentrate on a few sectors rather than attempt to be comprehensive, especially with very scarce resources. Development, Hirschman maintains, is communicated from the leading sectors to those that follow, from one firm to another. He argues that the advantage of unbalanced over balanced growth, "where every activity expands perfectly in step with every other, is that it leaves considerable scope to induce investment decisions and therefore economizes our principal scarce resource, namely, genuine decision-making" (Hirschman 1958, 62-63). Hirschman recognizes that investments may well become overconcentrated in primate cities because external economies tend to be consistently over-rated by investment decision-makers in the belief that nothing succeeds like success. However, he argues that in the long run public investments would cease to be pulled so heavily into primate cities largely because of considerations of equity and national unity. In this regard he is clearly overly optimistic. Hirschman suggests that infrastructure investment may be indispensable, but this is still only a permissive inducement mechanism. The essential task is to provide lagging regions with continuously inducing activities in industry, agriculture, and services.

B. Economic and Social Overhead Capital and Regional Development.

In this discussion infrastructure or public overhead capital (OC) is considered to consist of: economic overhead capital (EOC) and social overhead capital (SOC). EOC investment is oriented primarily toward the support of directly productive activities, whereas SOC consists of education, training, health, and related undertakings aimed at the development of human resources. Needless to say, this distinction, separating social from economic inputs, is one of emphasis rather than kind; EOC may also support the delivery of social services and SOC may contribute to directly productive activities, though in the latter case the impacts would tend to be less direct than those associated with EOC (Hansen 1965b). Nevertheless, it is an important distinction because the locations needing these kinds of investment differ.

Rondinelli points out that "such physical linkages as primary and feeder roads, rail and river transport, and energy and communications systems are essential for generating and spreading economic growth" (Rondinelli, 28). For purposes of this discussion, physical linkages fall within the economic overhead category. Rondinelli emphasizes that these projects foster the integration of a spatial hierarchy implicitly organized according to Christaller's market principle (Christaller 1966). However, Christaller distinguishes between the market principle, which is hierarchial and spatial, and the traffic principle, which is linear. In the case of highways and other transport systems, the traffic principle would lead to a relative geographic concentration of lower order central places along transport axes--if the main goal is the economic one of minimizing transport costs, rather than the distribution or marketing of a hierarchy of services from the least number of central places.

Essentially, the static analysis of transport axes done by Christaller is complemented by a model introduced by Pottier (1963) that is more dynamic version of this topic. Pottier maintains that economic expansion tends to follow a linear spatial path because of the influence of transportation routes linking important industrial centers. Growth of traffic along the original routes results in economies of scale and lower unit costs; therefore new technologies can be more readily incorporated into the existing infrastructure because the volume of traffic guarantees their "profitability." However, by lowering transport costs, the resultant increase in traffic volume creates still more demand for improvements. This cumulative process tends to concentrate and juxtapose various modes of transportation along the original major routes. Thus, population, industry, and commerce cluster along these axes, which represent extended but easily accessible markets attractive to new economic activity. Even agriculture in proximity to these development axes benefits compared to that in other areas because of its greater involvement in the growth dynamics. In the past, the location of a development axes was influenced primarily by considerations of physical geography, but now it is possible to create a basis for more widely dispersed development by means of public intervention. "Through its control or influence over economic infrastructure the modern State holds a decisive development control lever" (Pottier 1963, 128).

There seems to be widespread agreement that improved transportation systems and other forms of EOC are essential for upgrading the development of an area and of individual settlements. Nevertheless, in the developing country setting this requires huge investments that often initially yield slow returns (Hardoy and Satterthwaite 1980, 395). Because of the ever-present problem of the scarcity of the resources needed for investment, difficult choices must be made concerning the location of EOC. At this point it is necessary to go beyond the distinction commonly made between "developed" and "undeveloped" regions.

II. Targeting of EOC and SOC According to Regional Characteristics.

In the following discussion, the concept of unbalanced growth is supported by means of arguments addressing infrastructure and directly productive activities. The argument is elaborated in the context of contemporary developing countries. First, the need for both economic and social infrastructure in rural development planning will be considered. In particular, it is argued that a more precise treatment of central issues can be achieved by making a distinction between social and economic infrastructure. Interestingly, Hirschman's approach ignores social infrastructure. Discussion here separates social from economic infrastructure, examining both. Subsequently, questions concerning the location and timing of these two distinct types of investment will be examined under the framework of a regional public investment paradigm. Finally, consideration is given to opportunities for expanding directly productive activities in various types of regions.

A. <u>A Regional Typology</u>

Elsewhere (1965b, 1982) I have argued that for policy purposes regions may be clasified three categories: <u>congested</u>, <u>intermediate</u>, and <u>lagging</u>. <u>Congested</u> regions, typically primate cities, or several large clustered urban agglomerations, are charcterized by very high concentrations of population and economic activity. They have high levels of EOC and SOC. Such regions benefit from external economies of agglomeration. However, further expansion generates large marginal social external diseconomies resulting from pollution, congestion and similar problems. <u>Intermediate</u> regions are those that offer significant advantages--natural resources, qualified labor, plentiful energy, and so forth--to businesses. More importantly, they do not generate the degree of external diseconomies of agglomeration found in congested regions. In other words, the marginal net social product is greater in intermediate regions than in congested regions. <u>Lagging</u> regions, by contrast, have few attributes that would tend to attract new economic activity. In developing countries these are usually the poor rural areas.

My typology bears a close resemblance to a regional classification made by Lo and Salih (1981, 144), which is based on the dynamics of urban-rural relations and contains four categories:

(1) <u>metropolitan dominance</u>: the region comprising the primate city and the immediate surrounding countryside;

(2) <u>urban (metropolitan) shadow</u>: the region close to a major growth or dominant center;

(3) <u>mixed rural-urban region</u>: symbiosis of a regional urban hierarchy within a relatively prosperous agricultural region--this category may be divided between regions having large urban centers (candidates for industrial decentralization) and those with large agriculturally based towns (which may act as centers to mobilize development from below);

(4) <u>rural dominance</u>: lagging region low in agricultural productivity and lacking in urban facilities and functions.

With the exception of the urban shadow region, congested, intermediate and lagging regions correspond to metropolitan, mixed rural-urban, and rural types, respectively. The urban shadow has no counterpart in my typology because the economic growth of such regions represents a kind of suburbanization vis-à-vis congested regions rather than focusing specifically on decentralization of economic activity on a national scale. Moreover, the distinction that is made between regional subtypes under the mixed rural-urban level is consistent with distinctions that will be made concerning appropriate EOC investments in intermediate regions.

B. <u>EOC-Induced Development in Intermediate Regions</u>

In terms of economic decentralization strategies, in my view, it is appropriate to introduce public policies to limit the growth of infrastructure and directly productive activities in congested regions in favor of alternative locations. This results in an unbalanced growth approach, which together with the regional and infrastructure distinctions (made above), suggests that on efficiency grounds, EOC investments should be concentrated relatively heavily in intermediate centers or regions which have an environment already favorable or at least potentially favorable in one or more respects to the creation or expansion of directly productive activities (see Table 1). Moreover, empirical evidence suggests that under these conditions a development strategy based on initial excess EOC capacity can be effective. In the work highlighting the role of secondary cities in regional development, Belsky, et al. and others point out that investment in secondary city transportation and other infrastructure investment will stimulate growth in the entire city region. For example, "Korea's policy of extending highways, providing utilities, upgrading power and energy capacity, and establishing infrastructure in middle-sized cities that were designated as centers of manufacturing, allowed these cities to support large-scale industry successfully" (Belsky, et al. 1983, 22; see also Park 1981). Evidence from Argentina, India, Nigeria and Sudan also indicates that major transportation infrastructure investments have made possible a variety of development advances with immediate impacts on the productive bases and settlement patterns of intermediate regions (Hardoy and Satterthwaite 1980, 395).

More directly relevant empirical evidence also supports the proposition that it is neither economically efficient nor very effective to attempt to induce economic growth in lagging regions via EOC investments, as long as intermediate regions hold more promise. In a specific test of the EOC-SOC paradigm being discussed here, Looney and Frederiksen (1981) used a cluster

TABLE 1. UNBALANCED GROWTH AND REGIONAL DEVELOPMENT

Type of Region	Leading Sector in Development Strategy	Induced Intermediate-Term Consequences	Induced Long-Term Consequences
Congested	---	---	---
Intermediate, with large urban centers	EOC	Large and/or intermediate-scale industrial development	Induced SOC; balanced growth
Intermediate, with agriculturally based towns	EOC	Modernization and Diversification of agriculture; small-scale industrial development	Induced SOC; balanced growth
Lagging	SOC	Human resource development; net outmigration	Induced EOC; balanced growth

analysis to identify where the states of Mexico fall relative to their position as either intermediate or lagging regions. Initially, the Federal District (Mexico City) was identified as a congested region. A production function was estimated by multiple regression analysis for the intermediate and lagging regions. The results, after controlling for other variables, identified a statistically significant coefficient of each of the EOC measures to explain the within-group variation of per capita gross domestic product in the intermediate group of states. In contrast, none of the coefficients of the EOC variables were statistically significant in explaining variations in per capita gross regional product in the lagging group of states. A test for causality further suggests that EOC was the initiating factor in the development process, rather than other passive or induced phenomena.

Similar tests were made in the context of an examination of the effects of road density on income levels for the provinces of the Philippines. Linear regression models were constructed with provincial income as the dependent variable, and population, area, and various road density variables as the independent variables. In every case, the population level was statistically significant, but area had no discernible effect on income levels. In addition, the road density variable was statistically significant only when it was specified as paved road density. Subsequently, the provinces were classified, by means of cluster analysis into an intermediate group and a lagging group; the equations were re-estimated for each group. The coefficients for population were significant in all equations, but those for unpaved roads were not significant in either group. In the main, the results with respective to paved roads are instructive. The conclusion drawn by Looney and Frederiksen substantiates the significant role of EOC in the form of paved roads in their study area:

> The results confirmed the Hansen thesis for the Philippines. Paved road density (considered to be economic overhead capital) was found to be significant only for the intermediate group. A correlation coefficient between large firms and provincial income in the intermediate group was computed to be .95, which lent support to the mechanism of income growth as suggested by Hansen. Large firms tend to be attracted to the provinces with higher paved road densities. This in turn leads to higher income levels (Frederiksen and Looney 1982, 347).

It should be noted that intermediate regions that have been considered as priority locations for EOC investments have been those with secondary urban centers that can provide an efficient basis for industrial decentralization. However, consistent with the regional classification scheme of Lo and Salih, intermediate regions of the "mixed rural-urban" type also include those characterized by agriculturally-based towns which may serve to promote development from below. In an essentially agricultural setting, the notion of emphasizing EOC in intermediate areas would thus have to be modified because external economies of urban agglomeration may not be present in any great degree. Nonetheless, regions possessing what might be termed "natural resource externalities" could be targeted for EOC investment, especially in the form of irrigation and scientific farming techniques such as those associated with the Green Revolution. This issue will be surfaced again later in this discussion.

C. Lagging Regions: The Need for SOC

If lagging regions tend to be inefficient locations for EOC, the situation with respect to infrastructure oriented toward social, health, and educational services, (SOC), is quite different. In contrast to congested and intermediate regions, the SOC needs of lagging regions are relatively great. Low income levels are superficially used to account for lack of services. On the basis of data from a variety of developing countries, Henderson (1980) found that there were wide differences among nominal regional per capita incomes. However, when cost-of-living differences were taken into account, interregional real wage differences were found to be quite small for workers in similar occupations. The main reason offered by Henderson for the quality of life in lagging rural areas being below that in larger cities is "the minimal access of rural people to services that are standard or almost standard in urban areas. Thus, a major reason to move to urban areas could be to enjoy the greater public services, particularly the access to better quality educational facilities and better public health" (Henderson 1980, 84).

The relatively large need for SOC in lagging regions does not mean that the need for more SOC in congested and intermediate regions is reduced. Once excess EOC capacity has induced sustained growth in intermediate regions, these regions often devote more of their internal resources to the local provision of SOC (Hansen 1965a; Westphal 1981). Thus, marginal productivity considerations indicate that central government SOC outlays should be concentrated in lagging regions rather than in areas relatively well-equipped in these services. It is pertinent to note that in their study of the regional impacts of infrastructure investments in Mexico, Looney and Frederiksen (1981) found that none of the SOC measures they used was statistically significant in explaining variation in per capita gross domestic product among intermediate regions. On the other hand, each SOC measure was significant in explaining such variation within the set of lagging regions. Although the emphasis of the present study is on long-term development, the results just cited suggest that there does not necessarily need to be a short term trade-off between the objectives of economic growth and the reduction of income disparities. Finally, it may also be noted that concentration of SOC in lagging regions can be consistent with the policy goal of providing for the basic needs of the most disadvantaged population groups.

A significant factor complicating analyses of the effects of infrastructure investments on lagging regions is interregional labor mobility. EOC in the form of better transportation facilities would make areas with higher wages or better public services more accessible, which in turn could encourage outmigration. SOC investments that enhance workers' health, skills, and training may also induce outmigration to places where employment opportunities are better. In the long run, however, outmigration may decline. Many persons who benefit from initial concentration on expanded SOC (assuming that policy is based on opportunity cost evaluations) will choose to remain in lagging regions despite the immediate economic disadvantages. Reasons for this stability include attachment to family, friends, surroundings, and the local culture. These persons, as well as potential return migrants, constitute a body of qualified labor sufficient to permit greater emphasis on EOC investments. Then external economies resulting from balanced SOC and EOC growth could provide a basis for the growth of directly productive activities. In any event, more immediate considerations must take account of the initial tendency for outmigration to increase in response to expanded EOC or SOC. In strictly economic terms, migration should in itself represent an equilibrating mechanism because theoretically the marginal product of workers who remain in lagging regions should increase. Nevertheless, migration does involve money and time costs, as well as social costs of adjusting to new locations.

Finally, it should be pointed out that while the benefits of SOC investments in lagging regions are not likely to become dramatically evident in the short run, these investments have a positive impact in that they permit a more gradual adaptation of regional population to regional resources. As previously noted, EOC investments may be not only ineffective, but literally disruptive to lagging regions. This has been evident in Mexico where EOC infrastructure related to the exploitation of oil and gas has generated negative social, economic, and environmental consequences for local residents. Moreover, a poor transportation system can protect markets for small-scale rural firms; improved transportation that gives small towns and rural areas better access to larger towns and cities can destroy such enterprises, as has been seen in several regions of India (United Nations Centre for Regional Development 1982, 33).

D. Improving Agricultural Productivity

Having examined the nature and significance of infrastructure policies from a national perspective, it is also important to focus on the interregional settings of regions whose people have tended to be bypassed by national development processes. Two types of regions will be considered: (1) intermediate or "mixed rural-urban" regions with agriculturally-based towns and natural resource externalities that provide an immediate potential for development from below; and (2) lagging rural areas that do not have this immediate potential.

In considering the first type, initial attention should be devoted to processes for improving productivity in agriculture such that the benefits are widely diffused among the local residents. The mechanization of agriculture, and the use of tractors in particular, can increase productivity, but not without the displacement of labor as a highly possible consequence (Rhoda 1979). The technologies associated with the Green Revolution have been criticized on the grounds that they lead to greater income inequality (Douglass 1981; Rhoda 1979). However, most evidence indicates that the concomitant advances in agricultural productivity and income have been widespread, when the appropriate institutional and policy environment exists. Because the high- yield seed and fertilizer combinations--the core technology of the Green Revolution--are highly divisible, they can be employed within existing frameworks of small-scale farm units. This approach has been successfully implemented in Japan, Taiwan, and South Korea, countries relying heavily on such divisible innovations as high-yield, fertilizer-responsive crop varieties that also are labor-using and capital-saving (Johnston and Clark 1982, 71, 84).

Northwestern India (Punjab, Haryana, and portions of adjacent states) provides a particularly striking example of the opportunities to increase agricultural productivity by combining controlled water use with improved seeds, fertilizers, and mechanization. This region produces about 90 percent of India's wheat and over 60 percent of the rice traded across state boundaries. The outputs of these staples tripled between the mid-1960s and late 1970s because of the application of Green Revolution technologies, and yields per acre were three times those in the rest of the country. Nevertheless, the average farm size has remained between five to eight acres, a modest range. Total labor inputs also have risen and farm wage rates for landless laborers are twice those elsewhere in rural India. These achievements were possible because small farmers were willing to adopt the new innovations, and also because the government took prior steps to assure farmers that the Green Revolution would be profitable to them. Specific measures reported by Donaldson (1981) provide specificity:

- a land consolidation program resulting in contiguous small farmer holdings with established tenure;
- roads provided to link villages and market towns;
- marketing cooperatives collecting levies on traded grain to finance roads, as well as to regulate markets needed to sustain increased commercialization;
- a system of grain procurement introduced, based on traditional arrangements and middlemen;
- fertilizer distribution deregulated, resulting in a tripling in use per hectare within ten years;
- minimum procurement prices announced before planting, and establishment in the previous year of procurement prices for grain as guaranteed prices for the next year, thus removing most of the farmers' price uncertainty; and
- providing credit and the re-investment of the substantial returns from increased productivity; consequently, private outlays for irrigation infrastructure increased rapidly and the area irrigated

> by modern pump wells increased ten-fold between 1964 and 1975 (Donaldson 1981, 18).

In 1980, the Consultative Group on International Agricultural Research presented a heavily documented case making four points: (1) Green Revolution technologies increase rural employment, (2) the incomes of large and small farmers increase proportionally, (3) neither farm size nor land tenure arrangements need preclude adoption of the relevant innovations, and (4) low-income consumers benefit from the nutritional impact of the new crops. However, it was found that the Green Revolution widens interregional income disparities (Critchfield 1981). These results are consistent with what should be expected from the EOC-SOC investment paradigm discussed earlier. The agriculturally-oriented EOC outlays induced economic and social benefits in the regions concerned, though regionally unbalanced growth widened income differences between regions. But the fact that it is difficult to make progress on all fronts in a region simultaneously should not prevent the seizing of opportunities when and where they exist.

The presence of sufficient infrastructure, the modernization and commercialization of agriculture, and the achievement of income surpluses for capital accumulation can provide a basis for the expansion of local manufacturing industries, as well as enlarging markets for the outputs of these industries. Indeed, changes in the composition of the labor force made possible by the expansion of nonfarm employment opportunities are crucial to sustained long run increases in productivity and per capita income:

> The experience of Japan, Taiwan, and China suggests that the growth of rural nonfarm employment can provide a highly

> significant source of alternative job opportunities. This requires, however, a decentralized pattern of industrial development which fosters growth of rural-based manufacturing firms employing labor-using, capital-saving technologies.... [T]he pattern of rural demand generated by widespread increases in farm productivity and incomes...provides a strong stimulus for expanded local production of simple consumer goods and items of farm and household equipment. These unsophisticated products can be manufactured with reasonable efficiency by small- and medium-scale firms which make maximum use of labor and locally available raw materials while minimizing requirements for capital and for imported raw materials and intermediate products. And being inexpensive, these products are affordable by small farmers with limited but gradually increasing cash income (Johnston and Clark 1982, 78).

E. Promoting Small-Scale Industry

The efficient expansion of nonfarm employment opportunities clearly requires that entrepreneurs mobilize local resources that otherwise would not be drawn into the development process. Because entrepreneurship is an elusive quality, it has proven difficult for governments to devise programs to create self-reliant, energetic and innovative economic behavior. In too many instances, governments have fettered the full potential of entrepreneurs in small-scale industry because of distorted or overregulated markets, or because government assistance has been extended in effective or even counterproductive ways. For example, specialized and subsidized public institutions have been created to provide loans to small-scale enterprises at low rates of interest. This had led to excessive demand for cheap credit and a need for credit rationing, which in turn has led to abuses in the allocation process. Low interest rate ceilings have also deterred commercial banks and other financial institutions that cannot draw upon subsidized funds when lending to small firms, thereby contracting the total amount of credit available to these firms. Central small industry institutes have also been set up to provide an array of services, but experience in this regard often has been disappointing because of the difficulty of addressing the needs of heterogeneous small enterprises, and the weak rapport between the civil service staff and the relevant businessmen. Similarly, the use of selective controls to protect small firms from competition has often stifled technological innovation and adaptation so that consumer demand has shifted to more competitively priced products made by larger firms not subject to controls. A case in point is the substitution of synthetic textiles for cotton textiles made according to traditional handicraft techniques. In contrast, a more market-oriented approach could help small firms through measures designed to reduce subsidies and policy preferences that favor large industry and discriminate against small industry; to enhance the availability and efficient use of inputs commonly needed by small firms; and to increase the range of marketing opportunities for small firms (Marsden 1981).

It is significant that small-scale enterprises have tended to prosper most in countries that allow relatively free markets. In keeping with the notion that unbalanced growth is the most efficient way to economize scarce entrepreneurial talent, a free market environment encourages firms in different fields to form complementary, mutually beneficial relationships. With an expanding network of interdependent suppliers and customers, many of the supporting services can be provided by small firms and no longer need to be furnished by governments. Marsden makes a relevant point:

> small-scale enterprises have contributed substantially to economic and social development in Korea and Taiwan, which have relatively undistorted markets, though they are not completely free of biases against small firms (including credit rationing). Their success is reflected not so much in the expansion of output from, and employment within, the small-enterprise category itself but in the fact that many small enterprises had the vigor and opportunity to grow into medium- and large-scale enterprises (Marsden 1981, 15).

It should be noted that, in addition to providing private goods and services, small-scale enterprises also can play an important role in creating and maintaining local infrastructure. The basic costs of infrastructure extension can be cut by making more effective use of local human and material resources, which tend to be less expense than nonlocal resources and are sometimes available without cost under "self help" arrangements. The use of labor-intensive construction techniques for building rural infrastructure is being expanded in many Asian and African countries. It has also been demonstrated that the use of simple equipment can improve the efficiency of small-scale construction contractors. Small private contractors also can maintain infrastructure at a lower cost than government because they can engage in competitive bidding; and they have more flexibility in hiring, paying, and retaining workers according to their performance and the actual available workload (Willoughby 1981).

III. Intraregional Spatial Organization: Functional Economic Areas

In spatial terms, development strategies for mixed rural-urban regions with an agricultural base should avoid fruitless efforts to distinguish between "rural" and "urban" functions. In this setting the economic performance of small urban centers is closely related to the vitality of agriculture in the rural areas where they are located, though the development of urban centers will also have positive feedbacks on agriculture. Top-down industrial development strategies may be appropriate for mixed rural-urban regions with large cities, but in an essentially agricultural context "Urban structures and systems of communities do not develop from the top down, as assumed implicitly in the growth pole approach. Complex settlement patterns evolve from the bottom up" (Hackenberg 1980, 404). However, this process is not necessarily "natural" or inevitable--or it would already have taken place more generally. What is required are efforts, such as those already discussed, to modernize and diversify agriculture and to make it pos sible for local entrepreneurs to initiate and sustain small-scale industrial activities organically linked to agricultural development.

Symbiotic agricultural-industrial development and concomitant urbanization from below obviously needs to be dealt with in the spatial setting where complex functional interactions take place. An example of such a functional economic area is Comahue, in central Agrentina. Since 1960, this region has experienced rapid, complex agro-industrial development on the basis of fruit growing, processing, marketing and transportation. Comahue does not have large cities and is not located within the hinterland of any metropolitan area, but this has not precluded the development of intraregional metropolitan functions:

> Although there is no large city in Comahue, there exists a set of six or seven towns with 10,000-80,000 inhabitants close to each other which jointly behave as a single city for the whole region. Each town fulfills functions which may be absent in the rest, thus complementing each other. The whole set plus some smaller communities constitute the Upper Valley of Rio Negro and Nevquen subregion and in fact function as a

> metropolitan area (i.e., a point in space whose influence dominates a vast area) without physically being an actual metropolis (i.e., a large continuous built-up area) (Hardoy and Satterthwaite 1980, 404).

The spatial configuration of the urban system within mixed rural-urban functional economic areas need not correspond to any particular abstract planning blueprint. It may be a hierarchical network of central places; a linearly-oriented network corresponding to the development axes described by Pottier (1963) and the traffic principle of Christaller; or more likely, some mixture of these two models. In any case, it will certainly be conditioned by the inherited urban system as well as the physical geography of the region. In agriculturally-based functional economic areas in particular, the benefits of modernized agriculture and the development of small-scale enterprises will be enhanced and diffused by the provision of appropriate transportation linkages. As Rondinelli has pointed out, "The extension of physical linkages, especially through the construction of transportation networks in rural regions, is known to integrate economic subsystems and broaden opportunities for rural populations to participate in productive economic activities" (Rondinelli 1980, 285). Moreover, it would also be desirable to have regional-level institutional structures for political discourse and accountability, so that there can be an internal resolution of planning issues, and especially those related to social and economic inequalities and the competing objectives of various interest groups (Douglass 1981).

It is now necessary to consider spatial organization in lagging regions where agricultural productivity is low and urban facilities and functions are lacking. If, in keeping with the EOC-SOC infrastructure paradigm discussed above, emphasis is devoted to SOC investments in these regions, then efforts could be made to promote a hierarchy of central places à la Christaller. It should be recognized, however, that central place theory is essentially static; it does not even attempt to provide any explanation or theory for the process of economic develoment. But it does provide a model for efficient services delivery, including services that promote the development of human resources, which in turn are made possible by expanded SOC. However, if people are to have access to the relevant services located in central places, a minimally adequate transportation system is needed. Unpaved roads may even be regarded as SOC investments in this context (Frederiksen and Looney 1982). The Appalachian development program in the United States, in fact, regarded secondary roads as the matrix within which SOC investments would be proven effective (Hansen 1969). Nevertheless, available resources may not always be sufficient to permit the creation of a transportation-linked central place network. In these cases, planning needs to shift attention from older to newer technologies.

It should be recognized that too much emphasis on moving people to service delivery points can divert attention from feasible alternatives, such as the use of electronic communications to deliver services to people in proximity to where they live. Mexico, for example, has begun to develop a space program despite the country's current economic crisis, that is expected to revolutionize rural communications by the end of the present decade (Krauss 1982). A satellite owned by the government will relay television programs, telephone calls, and telex and telegraph messages across the country. By 1990, every Mexican community with a population of more then 500 persons will have telephone service, whereas today some 100,000 hamlets and villages have no telephones. The space program will be used to stimulate domestic electronics, computer, and fiberglass industries and to facilitate business transactions. Of particular interest in the present context, the Mexican government plans to use morning public television to instruct classes in remote villages that cannot afford to have a full staff of teachers. Programs to instruct farmers in modern agricultural techniques will be broadcast in the afternoon. Clearly there will be much to be learned from these efforts, as well as from these efforts, as well as from any similar projects in other parts of the world.

Finally, it has been observed that the income multiplier effects of investments in lagging regions tend to flow to outside, higher-order centers, largely because of the absence of complementary business activities within the lagging regions (Nichols 1969; Friedmann and Weaver 1979). In order to capture, or internalize, more of these induced benefits, it has been proposed that efforts be made to encourage the closure, or selective closure, of lagging regions. Precisely how this would be accomplished has received relatively little attention. China's success in developing lower-order towns and decentralizing the urbanization process has frequently been cited, but even in this case, a bottom- up strategy was preceded by top-down policies dealing with resource development, industrialization, infrastructure development, population growth, and migration (Banerjee, Schenk and Wickham 1982). In general, there seems to be a paucity of historical evidence showing that sustained regional development can be realized under conditions of isolated self-reliance. In the final analysis,

> ...most critical policy reforms have to be initiated from above. To ignore the need for persistent top-down intervention to support and reinforce bottom-up planning approaches plays into the hands of those power elites who would rather pay only lip-service to the necessary income and wealth distribution goals. In the present context, the recognition of the complementarity between top-down and bottom-up planning is important in that it does not absolve national governments from the responsibility for helping the small cities and their hinterlands (United Nations Centre for Regional Development 1982, 59).

IV. Conclusion

In this paper a regional context is used as the framework from which to focus on long-run development strategies. This approach stands in contrast to approaches that only treat the symptoms of poverty. Because developing countries lack the resources to do everything that might be desirable, even within a fairly long time horizon of a generation or longer, it is argued that unbalanced growth is the most effective means for promoting a pattern of sustained development that is both economically efficient and able to be broadly diffused socially.

The proposed regional development strategy is outlined (see Table 1). An appropriate infrastructure policy is a necessary precondition for the expansion of directly productive activities outside of congested regions (typically primate cities), with emphasis on EOC investments in intermediate regions and SOC investments in lagging regions that have relatively weak development potential. In the intermediate term, EOC will induce directly productive activities in intermediate regions, though complementary policies will be needed with respect to the enhancement of agricultural productivity and the promotion of small-scale industry. Meanwhile, SOC investments will lead to the development of human resources in lagging regions, where needs for it are relatively great. In the long term, intermediate regions can finance a major share of their own SOC outlays; qualified labor in lagging regions can, in combination with EOC investments, provide a basis for expanded directly productive activities. Throughout this process, limitations would be put on the expansion of congested regions.

Finally, the implications of the foregoing issues for intraregional spatial organization are considered. In particular, attention is directed toward the nature of appropriate functional economic areas in intermediate and lagging regions, respectively.

In the end, of course, practical knowledge concerning the specific spatial, temporal and organizational linkages that constitute the development process must be based upon detailed country analyses and an evolutionary learning process.

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